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L4: Entry 23 of 30 File: DWPI Jul 30, 1991

DERWENT-ACC-NO: 1992-207315
DERWENT-WEEK: 199225
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TITLE: Pasteuriser for milk, fruit-vegetable juices, etc. - has body contg. discs with coupled circular channels through which liquid flows from inlet pipe, with speed change

INVENTOR: MUN, T H; TUMCHENOK, V I

PATENT-ASSIGNEE:

ASSIGNEE	CODE
AS USSR FRA E RES CENTRE WATER ECOLOGY	ASFAR

PRIORITY-DATA: 1983SU-4661480 (March 13, 1983)

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PATENT-FAMILY:

	PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
☐	SU 1666021 A1	July 30, 1991		003	A23C003/03

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
SU 1666021A1	March 13, 1983	1983SU-4661480	

INT-CL (IPC): A23C 3/03; A23L 3/20

ABSTRACTED-PUB-NO: SU 1666021A
BASIC-ABSTRACT:

Body (1) has inlet/outlet (2,3) pipes for prod.; concentric to inlet pipe (2) are discs (4,5) with coupled circular channels (6). Meshes (7) are fixed between channels of bottom disc (4) and distance between working surfaces of discs (4,5) is determined by mathematical formula in terms of length of perimeter at corresp. point (m.); and a constant 'A' = rotational frequency (3000 r.p.m.) 0.002 cu.m, or 0.000133 cu.m or 0.000066 cu.m, w.r.t. productivity = 36 cu.m/hr, 24 cu.m/hr., and 12 cu.m/hr., respectively.

Prod. to be pasteurised is fed along pipe (3) to gap between discs (4,5) where meshes (7) are given rotary motion by drive (8). As prod. transfers from gap to circular channels (6) speed drops abruptly and, according toe Berrnoulli's Law, the dynamic pressure is converted into static pressure with multiple increase in its value, creating conditions to break down cell membranes of pathogenic flora, i.e. pasteurisation. Mechanical breakdown is done repeatedly.

USE/ADVANTAGE - In pasteurisation of milk, fruit.vegetable juices, etc. in food industry and agriculture. Effectiveness is increased. Bul.28/30.7.91

CHOSEN-DRAWING: Dwg.1/2

TITLE-TERMS: PASTEURISATION MILK FRUIT VEGETABLE JUICE BODY CONTAIN DISC COUPLE CIRCULAR CHANNEL THROUGH LIQUID FLOW INLET PIPE SPEED CHANGE

DERWENT-CLASS: D13

CPI-CODES: D03-A04; D03-H02;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C1992-094304

PASTEURIZER

V. I. Tumchenok and Ten Hak Mun

UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. MARCH 2004
TRANSLATED BY THE RALPH MCELROY TRANSLATION COMPANY

STATE BOARD OF INVENTIONS AND DISCOVERIES OF THE
USSR STATE BOARD OF SCIENCE AND TECHNOLOGY
INVENTOR'S CERTIFICATE NO. SU 1666021 A1

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PASTEURIZER

[Pasterizatov]

Applicant:	Institute of Aquatic and Ecological Problems, Far-East Science Center, USSR Academy of Sciences
Inventors:	V. I. Tumchenok and Ten Hak Mun
UDC:	637.132 (088.8)
References Cited:	Surkov, V. D. et al. Dairy industry equipment. Moscow, PP Publishers, 1970, p. 153 Austrian Patent No. 319720 Classif. A 23 C 7/00, 1970

The invention pertains to the pasteurization of milk, fruit and vegetable juices and may be used in the beverage industry and in agriculture.

The purpose of the invention is to increase the efficacy of pasteurization.

Figure 1 shows the pasteurizer in axial section, Figure 2 shows a plan view of same; and Figure 3 shows the disks in axial section.

The pasteurizer contains a body 1 with product inlet 2 and outlet 3 pipes and disks 4 and 5 concentric to pipe 3 equipped with coupled circular channels 6; the surface of the bottom disk 4 is equipped with meshes 7, the size of whose openings decreases from the axis of the drive 8 of disk 4 towards the periphery; the cross-sectional open area of the coupled circular channels 6 likewise

decreases; and the distance between the working surfaces of disks 4 and 5, calculated from a mathematical formula, is adjusted by threaded rods 9. The bottom disk is equipped with a labyrinth seal 10.

The distance between the working surfaces of the disks is calculated using the mathematical formula

$$h = A/(\pi D)^2$$

where h is the distance between the disks in m;
πD is the length of the perimeter at the corresponding point in m;
and A is a constant which for a rotational frequency of 3000 rpm is equal to 0.0002 m^3, 0.000133 m^3, or 0.000066 m^3, depending on whether the productivity is 36 m^3/h, 24 m^3/h, or 0.000066 [sic, for 12] m^3/h, respectively.

Equipping the pasteurizer with meshes affixed between the coupled circular channels of the lower disk eliminates slippage of the product and increases the motive force of the pasteurization process, i.e., centrifugal force, while the mesh size decreases from the axis of the disks to the periphery, and the cross-sectional open area of the circular channels likewise decreases, which shortens the distance between the zones of pasteurization. Setting the distance between the disks according to a mathematical formula eliminates layering of the product and reduces slippage. All of the above increases the degree of pasteurization.

The pasteurizer works as follows:

The product to be pasteurized is fed via inlet 3 into the gap between disks 4 and 5, where, via meshes 7, it is drawn into rotary motion by drive 8. As the product moves from the gap to circular channels 6, the speed drops sharply, and by Bernoulli's law dynamic pressure is converted into static pressure, which becomes several times as great, creating conditions for rupture of the cell membranes of pathogenic flora, i. e., pasteurization. This mechanical rupturing takes place many times.

To prevent counter-slippage of the product, the distance between the disks is adjusted according to the formula.

For a productivity of 36 m^3/h and D = 0.1 m (with A = 0.0002 m^3), h = 0.002028, while for D = 0.4 m, h = 0.0003166 m.

Claim

A pasteurizer, containing a body with product inlet and outlet pipes and disks concentric to the inlet pipe, provided with coupled circular channels, characterized in that, in order to increase the efficacy of pasteurization, it is equipped with meshes affixed between the coupled circular channels of the bottom disk, and the distance between the working surface of the bottom and top disks is calculated using the mathematical formula:

$$h = A/(\pi D)^2$$

where h is the distance between the disks in m;

πD is the length of the perimeter at the corresponding point in m;

and A is a constant in m^3, which at a rotational frequency of 3000 rpm is equal to 0.0002 m^3, 0.000133 m^3, or 0.000066 m^3, depending on whether the productivity is 36 m^3/h, 24 m^3/h, or 12 m^3/h, respectively.

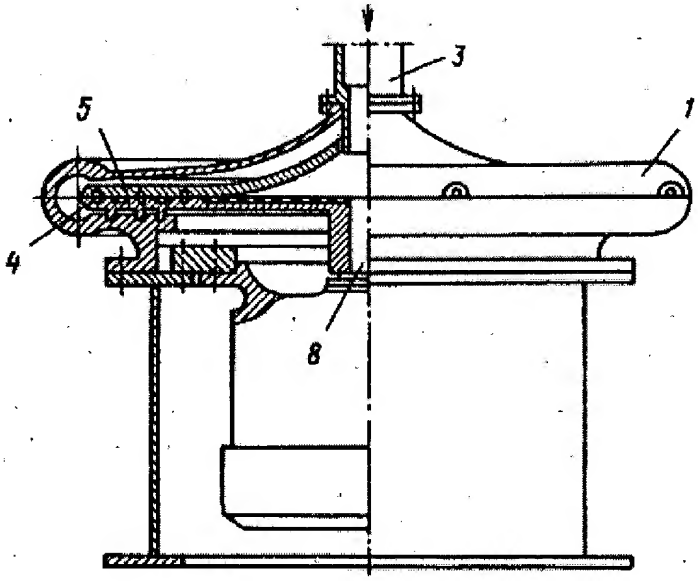

Figure 1

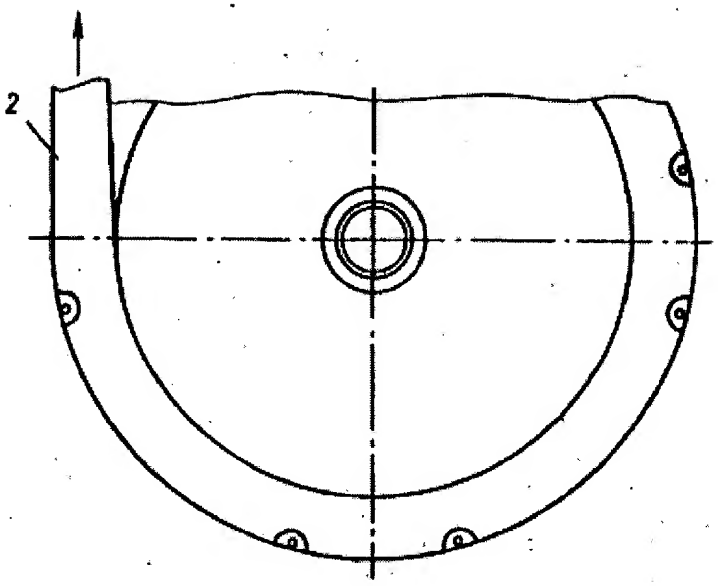

Figure 2